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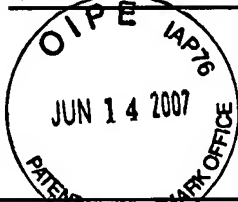
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/808,558

03/24/2004

Maximo Gomez-Nacer

174-001

4773

7590 06/06/2007
MAXIMO GOMEZ
P.O. Box 296
WEST NEW YORK, NJ 07093-0296

EXAMINER

FENSTERMACHER, DAVID MORGAN

ART UNIT	PAPER NUMBER
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3682

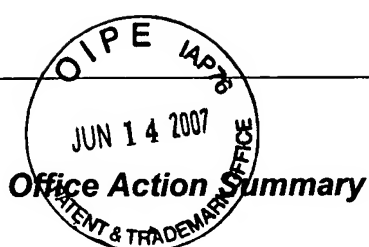
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06/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



Application No. 10/808,558	Applicant(s) GOMEZ-NACER, MAXIMO	
Examiner David M. Fenstermacher	Art Unit 3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.138(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the first action on the merits. Claims 1-8 are pending.
2. An examination of this application reveals that applicant is unfamiliar with patent prosecution procedure. While an inventor may prosecute the application, lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

A listing of registered patent attorneys and agents is available on the USPTO Internet web site <http://www.uspto.gov> in the Site Index under "Attorney and Agent Roster." Applicants may also obtain a list of registered patent attorneys and agents located in their area by writing to the Mail Stop OED, Director of the U. S. Patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450

Oath/Declaration

3. The Oath/Declaration filed 8/18/04 is acceptable.

Drawings

4. The drawings, filed 8/18/04, are acceptable as formal.

Specification

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because it should not use language which can be implied "According to a preferred embodiment". Correction is required.

See MPEP § 608.01(b).

Content of Specification

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).

Art Unit: 3682

- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
 - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
 - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where

elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.

- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-8 are rejected as failing to define the invention in the manner required by 35 U.S.C. 112, second paragraph.

The claim(s) are narrative in form and replete with indefinite and functional or operational language. The structure which goes to make up the device must be clearly and positively specified. The structure must be organized and correlated in such a manner as to present a complete operative device. The claim(s) must be in one sentence form only. Note the format of the claims in the patent(s) cited.

The following are examples only and the claims must be revised and placed in proper US form.

Claim 1, line 1 "The process" is indefinite since it is not clear if this is intended to be an apparatus or method claims. Also, there is no antecedent basis.

Generally speaking, the first recitation must be "a gear" then subsequent referrals to this gear would be "said gear". The claims begin most recitations with "the" which is incorrect and indefinite. Review the claims in their entirety.

The use of alternative language is generally unacceptable and indefinite. For example in claim 1, "directly or indirectly" is indefinite since it is not clear which is required.

Anything in parentheses is read out of the claims.
Please review the cited patents for proper claim drafting.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 3682

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 3, and 7, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by WO 91/09226.

WO 91/09226 shows the claimed invention where a device is used to convert the movement of an animal to generate electricity, the device comprising a prime mover (1A) which is fastened to the leg of an animal to convert the movement of the leg to electricity (see abstract).

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claim 6, as best understood, is rejected under 35 U.S.C. 102(b) as being anticipated by Bakholdin et al. (6,175,172).

Bakholdin et al. shows the claimed invention where a flywheel (11) is used to store electrical energy.

12. Claim 8, as best understood, is rejected under 35 U.S.C. 102(b) as being anticipated by David (5,606,936).

David shows the claimed invention a low power device is used as a stimuli for an animal.

Allowable Subject Matter

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13. Claims 2, 4 and 5 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Conclusion

14. The following are suggested formats for either a Certificate of Mailing or Certificate of Transmission under 37 CFR 1.8(a). The certification may be included with all correspondence concerning this application or proceeding to establish a date of mailing or transmission under 37 CFR 1.8(a). Proper use of this procedure will result in such communication being considered as timely if the established date is within the required period for reply. The Certificate should be signed by the individual actually depositing or transmitting the correspondence or by an individual who, upon information and belief, expects the correspondence to be mailed or transmitted in the normal course of business by another no later than the date indicated.

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Please refer to 37 CFR 1.6(d) and 1.8(a)(2) for filing limitations concerning facsimile transmissions and mailing, respectively.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Fenstermacher whose telephone number is 571-272-7102. The examiner can normally be reached on 10:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

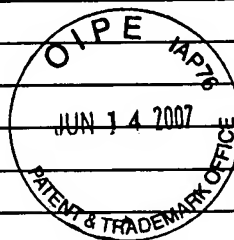
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DAVID FENSTERMACHER
PRIMARY EXAMINER
AV 3682
5/31/07

Notice of References Cited	Application/Control No. 10/808,558		Applicant(s)/Patent Under Reexamination GOMEZ-NACER, MAXIMO	
	Examiner David M. Fenstermacher		Art Unit 3682	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2002/0046713 A1	04-2002	Otto, James R.	119/720
*	B	US-6,837,186 B1	01-2005	Terao, Kazuto	119/700
*	C	US-6,175,172 B1	01-2001	Bakholdin et al.	310/74
*	D	US-254,665	03-1882	Leinbrock	185/16
*	E	US-368,825	08-1887	Getchell	105/26.05
*	F	US-5,606,936 A	03-1997	Davis, James E.	119/721
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			



FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	WO 91/09226	06-1991	WIPO	Bakran et al	F03G 5/08
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁵ : F03G 5/08, H02K 7/18	A1	(11) International Publication Number: WO 91/09226 (43) International Publication Date: 27 June 1991 (27.06.91)
(21) International Application Number: PCT/OA89/00001 (22) International Filing Date: 11 December 1989 (11.12.89) (71)(72) Applicant and Inventor: BAKRAN, Mohamed, Saleh, Abubakar [YE/MR]; P.O. Box 5035, Gamal Abd. Anasser Street, Nouakchott (MR). (81) Designated States: AT, AT (European patent), AU (Petty patent), BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE*, DE (Utility model)*, DE (European patent)*, DK, ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.		Published <i>With international search report.</i> <i>With amended claims.</i>
(54) Title: VERSATILE PORTABLE ANIMAL ENERGY CONVERTOR (57) Abstract <p>A versatile animal-laden portable animal energy converting system for harnessing a portion of animal kinetic energy while the animal is grazing or travelling utilizing said portion for generating and storing electrical and/or mechanical energy on board of same animal wherein said stored energy is collected, at intervals, for end-use wherever it is demanded in rural areas; so as to facilitate and modernize life there. In embodiment (A), prime movers (1A) each of which being fastened to a humerus or a thigh of an animal such as a camel, horse, cow, donkey etc. to convert the oscillational motion of said humerus or thigh, with driving belts (5A, 6A), pulleys (7A, 8A) and free-wheeled pulleys (17.OA, 18.OA), into rectified rotational motion to drive a device such as an electric generator (16) mounted on saddle (15A) which also includes a base (15.4) for a battery to store the generated electricity. In embodiment (B), no belts, pulleys or free-wheeled pulleys are used since each prime mover (1B) is directly in mesh with free-wheeled gears (Fig. 10)</p>		

* See back of page

DESIGNATIONS OF "DE"

Until further notice, any designation of "DE" in any international application whose international filing date is prior to October 3, 1990, shall have effect in the territory of the Federal Republic of Germany with the exception of the territory of the former German Democratic Republic.

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ES	Spain				

VERSATILE PORTABLE ANIMAL ENERGY CONVERTORFIELD OF THE INVENTION:

This invention relates to portable machines which are mounted on-board of animal for harnessing a portion of the animal movement, while the animal is grazing or travelling, to convert said portion into useable electric and/or mechanical energy.

BACKGROUND OF THE INVENTION:

Animal is well-known as a source of energy widely available for providing power for a variety of uses such as transportation, cultivation, lifting water from wells, rotatably driving grinding-mills and oil-mills and the like.

Billions of animals are available and globally distributed. If only a portion of the power of said enormous numbers of animals is effectively harnessed, it will provide a major contribution to other available sources of power.

Four disadvantages of animal power have been the cause of reducing its role in providing power for man use in comparison with the other sources of power. Said disadvantages are:

1. Restriction of the working animal within the working area during all the time of work. This means that the animal is restricted to work and being prevented from grazing as long as it is working; hence, a feeder is needed to be delivered to the animal after the work time to substitute the energy consumed in work and to provide it with its living needs. Delivered feeder is, in many cases, rather expensive.
2. A driver is usually needed to drive either a single animal or, in some cases, a couple of animals during the whole time of work except for transportation where a considerable number of animals, (a caravan), can be linked and hence be driven by a man or two. The cost of the driver, in most cases, is not less than the cost of the feeder mentioned above. Thus, the cost of power produced

by the animal has not been low.

3. In all applications, except for transportation, concentration of animal power to meet a relatively high power demand in a particular limited area has been impossible. That is because it has not been possible to connect a considerable number of animals all together to productively drive a single mill or machine or to pull a large plough or the like.

OBJECTS OF THE PRESENT INVENTION:

The principal objects of the present invention are :

1. To provide apparatus and means which overcome the above mentioned disadvantages so as to help animal to be able to play a considerably competitive major role in providing power for a wider variety of uses to the benefit of man-kind particularly in rural areas to help facilitate life there; more particularly the life of graziers who live in pastures or in grasslands whether they are villagers, semi-nomads or nomads peregrinating with their animals for pasturage. In other words, to help modernize and facilitate nomadism life.

Said modernization and facilitating of life in rural areas will, undoubtedly, increase the economical role of rural areas in the general economy of every country all over the world increasing the gross national product (GNP) of each country.

2. To provide such apparatus and means capable of contributing effectively in the current international campaign for reducing environmental pollution caused by the so called "the GREEN HOUSE EFFECT ". In other words, to help reduce the green house effect detriment.
3. To adapt rural areas for absorbing the jobless people who are nowadays living in large cities suffering from unemployment. This will also reduce the pressure on said cities caused by the increasing immigration of people from rural areas towards cities. In other words, to stop rural-to-city immigration and create a reverse immigration, city-to-rural.

4. Since food is the world's number one priority, it is a principal object of the present invention to provide apparatus and means capable of increasing food production activity in its wider sense.
5. To help solve the problem of land desertification via providing such apparatus and means capable of easing the widening of plantification activity in addition to eliminating the need for combusting plant matter (wood) in rural areas for cooking, heating, lighting and other uses;

Other objects and advantages of this invention will become apparent from the accompanying description taken in conjunction with the accompanying drawings wherein are set forth, by way of illustration and example, certain embodiments of this invention.

SUMMARY OF THE INVENTION:

The present invention provides an animal-powered energy system comprising portable apparatus and means for generating and storing electrical and/or mechanical energy on board of animal while the animal is grazing or travelling, utilizing a portion of the animal kinetic energy; whereinto said stored energy be collected, at intervals, for end-use.

BRIEF DESCRIPTION OF THE DRAWINGS:

FIG.1 is a front view of an animal-powered motor-generator embodying a mien of the present invention.

FIG.2 is a perspective view showing how the contrary free wheels work.

FIG.3. is a sectional view of a contra-rotated electric generator with its relevant components.

FIG.4 is a side view of said generator.

FIG.5 is a side view of a saddle with a base on which the electric generator is installed.

FIG.6 is a perspective view of said saddle.

FIG. 7 is a perspective view of another embodiment of said saddle.

FIG. 8 is a free body diagram showing the movement range of prime mover 1A.

FIG. 9 is a descriptive view showing a camel with a prime mover 1A tied to its humerus.

FIG. 10 is a side view of prime mover 1B meshed to electric generator 16 in embodiment B.

FIG. 11 is a view of prime mover 1B.

FIG. 12 is a view of another shape of prime mover 1B.

DETAILED DESCRIPTION OF SOME PREFERRED EMBODIMENTS OF THE
PRESENT INVENTION:

Before explaining the present invention in detail, it is to be understood that the present invention is not limited in its application or use to the details of construction and arrangement of parts illustrated in the accompanying drawings, because the present invention is capable of other embodiments, variations and modifications.

With reference to FIG. 1 of the drawings, there is shown a first embodiment A including a prime mover 1A which constitutes the first moving member of the system. Said prime mover 1A is very simple in shape and can be manufactured from simple materials such as wood or from other light strong composite materials such as resins, aluminium alloys or any reinforced light-weight materials.

Said prime mover 1A is simply connected to humerus (upper arm) or to thigh of an animal by belts 3A which are fitted to the lower half of said prime mover 1A. Small cushions 2A are mounted to the inside front of said prime mover in order to smooth the contact between the prime mover and the animal humerus or thigh; in other words, to prevent any undesirable pressure on the muscles of humerus or thigh of the animal when driving said prime mover. When connected to humerus or thigh of an animal, the prime mover moves with said humerus or thigh in an oscillational way as shown in FIGS. 8, 9 where the oscillator is the upper half (O-U) of the prime mover 1A; point O is the pivoting point around which the prime mover 1A pivots back and forth every time the animal moves its leg or thigh one complete step. Position of point O is exactly parallel to the shoulder joint or the hip

joint of the animal. Thus, the upper tip U, (FIG. 8), of the prime mover 1A keeps stroking between point F and point R (FIG. 8) as far as the animal is moving. When the animal stops, the upper tip U stops in mid way between said points F and R.

Belts 5A, 6A are unclosed belts with metal rings fixed to either ends of each belt.

Four pivots 4A are mounted to the two faces of the upper end of prime mover 1A, two to each face, to provide pivots around which the said metal rings pivot to ease the intermovement between the belts ends and the prime mover 1A. When prime mover 1A oscillates, belts 5A, 6A are tensioned back and forth transferring the oscillational movement of prime mover 1A into rotational movement through free-wheeled pulleys 17.OA, 18.OA, as will be described later in the next paragraph, to drive either an electric generator 16 or an air compressor or to drive any small desirable device.

Free-wheeled pulleys 17.OA, 18.OA are small free wheels with grooved circumferences, for this embodiment A, while they are toothed for other embodiments such as embodiment B where no driving belt is used. Each free-wheeled pulley functions as a rectifier to rectify the back and forth movement of a driving belt 5A or 6A into one direction rotational movement exerted on the driving shaft of the generator or compressor or any device. Two contrarotatable free-wheeled pulleys are mounted to a drive shaft. This is done simply by contrary contact between belts 5A, 6A and pulleys 17.OA, 18.OA such that said belts contrarily contact said pulleys as shown in FIG. 2. Hence, when the two belts 5A, 6A are tensioned to the left, pulley 18.OA clockwise rotates the driving shaft while pulley 17.OA is freely rotating anticlockwise around said shaft allowing said shaft to be rotated under action of pulley 18.OA only. When said belts 5A, 6A are tensioned to the

right, pulley 17.0A clockwise rotates said shaft while pulley 18.0A is freely rotating anticlockwise around said shaft allowing said shaft to be rotated, this time, under action of pulley 17.0A only. Frequent oscillation of prime mover 1A provides the torque needed to accelerate the electric generator 16 or any other small device.

Generated electricity is directly stored in light-weight batteries which have high gravimetric energy density (high capacity to weight ratio).

Fortunately, the recently achieved advancement in the field of plastics that conduct electricity provides not only light weight batteries, but also polymer wires for winding generators and for connection lines from generator to regulator to battery.

For instance, the Bridgestone Corporation and Seiko Electronics Parts jointly developed a rechargeable battery with a polyaniline electrode that went on sale in Japan two years ago. The other electrode is made of lithium metal which is also very light. These batteries are said to have a capacity three times that of existing rechargeable lithium batteries of the same type and a voltage two to three times as high as nickel-cadmium batteries.

B.A.S.F.A.G., in West Germany, announced -two years ago - that by doping a very pure form of polyacetylene they had produced a material with twice the conductivity of copper by weight.

B.A.S.F. also developed a thin flexible rechargeable battery with plastic-metal electrodes which can save space and offer design freedom.

Hence, the present invention provides further applications to the conducting polymers and to polymer batteries.

Thus, the weight of generator and batteries needed for a single system of the present invention is low as well as the whole system is made of very light weight materials available in markets.

Stored electricity is collected every night to be either used for lighting or for operating devices such as

fans, heaters, stoves, microwave ovens, dehumidifiers, air-conditioning devices, refrigerators etc. ,as will be explained later within " Examples on its Applications" ; in case of stored compressed air, it is also collected every night to be either used or stored until it is needed..

Saddle 15A shown in FIGS.1,5,6 comprises the structural base of the system;most components and parts of the system are mounted to said saddle. Hings 15.1,in top of said saddle,provide flexibility for both suiting the size of back of animal and easing the resaddling-unsaddling of the system . The side beam 15A.3 on either side of the saddle is for providing fastening points for fastening belts 11A,12A,14A and two axles 9A are mounted to it with a pair of pullies 7A,8A around each axle to provide normal reaction in asuitable angle for belt 5A to drive free-wheeled pully 17.OA and for belt 6A to drive the two pullies 7A near the top of saddle providing ,in turn,reaction for belt 6A to drive free-wheeled pully 18.OA in the oposite direction to the other free-wheeled pully 17.OA.

Needless to say that some kind of cushions or cloth should be fitted to the inner sides of the saddle or be put on back of animal to smooth the contact between said saddle and the animal body..

On top of saddle 15A is the base 15.2 on which is mounted the desired device to be operated . A variety of devices can be operated alternatively;and even two different devices can be mounted on base 15.2,back to back,to be operated simultaneously by two prime movers 1A,in parallel planes, one from each side of the animal; for example, an air compressor on one side and an electric generator on the other side. Furthermore, another couple of devices can be similarly operated by another couple of prime movers 1A or 1B tied to the same animal thighs if the first couple of prime movers is tied to the animal humeruses; another base 15.2 can be installed somewhere as an addition to the saddle . More examples on versatility of the present invention will be described later within "Examples on its Applications" .

Although two conventional electric generators can be mounted back to back on base 15.2 to be separately operated by two prime movers 1A, a better choice is a single contra-rotated electric generator 16CON., shown in FIG.3, whose rotor 16.1 and "stator" 16.2 have two concentric shafts 16.3, 16.4 contrarily rotatable by two prime movers 1A tied to humeruses of a single animal where the two prime movers 1A oscillate in parallel planes with two belts 5A, 6A connected to each prime mover 1A and contact the free-wheeled pulleys 17.0A, 18.0A in the same way as mentioned above and shown in FIG.2, but -in this case- from either side of the generator; (keeping but repeating the same arrangement as in the case of a conventional generator 16, from either side,). In other words, as if two separate generators had been mounted back to back on the same base 15.2.

Rotation of shafts 16.3, 16.4 of rotor 16.1, "stator" 16.2 is contrary without any need for gearing; because each side of the generator 16CON. is looked at from one side of the animal and is driven by a prime mover 1A tied in the same side of animal; thus, clockwise rotation of the "stator" 16.2 at left side of the animal is opposite to clockwise rotation of the rotor 16.1 at right side of the animal.

construction of the contra-rotation electric generator 16CON. is as shown in FIG.3 where the housing 19 of said generator comprises: base 19.0 for fixing the whole generator to base 15.2 on saddle 15A by bolts 19.3; two hollow bosses 19.1, 19.4 to house two bearings 16.6 for the inner shaft 16.3 (shaft of rotor 16.1); two holes 19.5 to house two bearings 16.5 for the outer shaft 16.4 (shaft of "stator" 16.2); a number of holes 19.8 to fit together (fasten) the two halves of the housing 19 after installation of the generator with its bearings; handling bar 19.2 for facilitating the task of loading-unloading of the system and to provide perfect tightness to the housing 19.

A couple of free-wheeled pulleys 17.0A, 18.0A is mounted to shaft 16.3 while another couple with suitable diameter is mounted to shaft 16.4 at the other side of the

generator.

Size and weight of the generator and/or the whole system, for a given rated power, is apparently necessary to be as small and light as possible. However, factor of size is less important than factor of weight; hence, lightweight high-strength equipment is preferably used in construction of it although it can be built from conventional ordinary cheap materials but on account of productivity.

Available technology provides a wide range of lightweight high-strength materials for this purpose.

Examples on that are:

- titanium is more suitable for pulleys(7A,8A), axles 9A, shafts (16.3,16.4) and the like; (titanium axles have been used for modern bobsled and other devices.);
- laminated plastics(composites) are another choice for pulleys 7A,8A and free-wheeled pulleys(17.0A,18.0A), bearings and the like;
- carbon fiber, fiberglass composite, fiber reinforced plastics(such as: glass fiber reinforced plastics(G.R.P.)), resins(such as: epoxides, unsaturated polyesters) and the like are good for prime mover 1A, saddle 15A and the like;
- magnequench magnets(produced by General Motors, America), are suitable for electric generator 16 or 16CON., as said magnets are strong, light and inexpensive compared with rare material magnets;
- doped polyacetylene plastic wires(produced by B.A.S.F. in Germany) can replace copper wires for winding of electric generator 16 or 16CON and for connection lines from generator to regulator to battery;
- polymer-lithium rechargeable batteries(produced by Bridgeston & Seiko in Japan and those produced by other companies in other countries) are ideal as they are very light, have both very high capacity and relatively high voltage, have long life and do not contain toxic materials;
- aluminium alloys provide good materials for a wide range of the above mentioned components as well as for air compressors, air tanks etc.

SIZES OF THE SYSTEM:

Since the system is intended to be essentially powered by animal and since different kinds of suitable animals are available, the system size is governed by the following factors:

1. Kind of animal, (camel, cow, horse, mule, hinny, donkey, goat, sheep, dog). To suit kind of animal, sizes fall into three categories:
 - category a, for camel;
 - category b, for: cow, horse, mule, hinny and donkey;
 - category c, for: sheep, goat, dog and the like.
2. Age or size of animal: every category have three sizes: small, medium, large to suit three approximative ages of that kind of animal.

Sizes are classified or identified by category symbol a, b or c plus rated weight of such system.

Weight is, of course a very important limiting factor since every animal has a maximum limit of capability to carry loads. Nevertheless, many kinds of widely available animals have considerable maximum limits. For instance, an adult camel can carry a maximum load of three hundred kilograms (300 kg.) for tens of kilometres of distance; adult camel average load is 200 kg.; adult horse average load is about 130 kg.; adult cow, mule, hinny or donkey average load is approximately the same as adult horse average load; adult sheep, goat, dog or the like average ability to carry loads is 20 kg.

Since the present invention is directed to harnessing only a portion of each animal available power, the system weight should not and need not exceed one third of the animal maximum load. A reasonable weight of a system is one third of average load of the animal for which the system is designed. Yet, a system of 45 kg. weight is sufficient for an adult camel system; 30 kg. for an adult horse, cow, mule, hinny, or donkey system; 5 kg. for an adult sheep, goat or dog system. Table 1 shows suitable system weights for different categories.

TABLE 1
System Weight for Different categories

Kind of animal	Categ- ory	Age of animal	Average load of animal kg.	Suitable system weight kg.	Size classif- ication
Camel	a	Adult	200	45	a45
Camel	a	Medium aged	130	30	a30
Camel	a	Young	80	20	a20
Horse, cow, mule, hinny or donkey	b	Adult	130	30	b30
Horse, cow, mule, hinny or donkey	b	Medium aged	80	20	b20
Horse, cow, mule, hinny or donkey	b	Young	40	10	b10
			Average capabil- ity of carrying (kg.)		
Sheep, goat, dog or the like	c	Adult	20	5	c5

Yet, system sizes are not restricted to the limits shown in table 1. There is much flexibility in this matter as far as a system weight is less than the average load of the animal for which the system is designed.

A typical system size is a45 which is for an adult camel. Distribution of weight of said size on its components is shown in table 2 for only giving an example since it can be distributed in any proportion according to the kind of material from which each component is made.

TABLE 2

Distribution of weight of a typical system

Main component	Weight kg.
Two prime movers 1A, 2.5 kg. each.	5
Saddle 15A with its fittings + pivots + pulleys + side beams.	15
Contra-rotated electric generator 16CON. + free wheeled pulleys + driving belts.	12
Voltage regulator + connection wires from generator to regulator to battery.	2
Battery + its fittings.	11
Total weight	45

Rated power of each size is governed by kind of materials from which the system is made. Light-weight materials allow higher rated power for a system of a given weight. Systems whose weights are as shown in table 1 and are made from relatively inexpensive relatively widely available relatively light-weight materials are assumed to have rated power for each size as shown in table 3.

TABLE 3

Kind of animal	Weight of system	Size classification	Rated power. Watts
Camel.	45	a45	200
Camel.	30	a30	120
Camel.	20	a20	65
Horse, cow, mule, hinny or donkey	30	b30	130
Horse, cow, mule, hinny or donkey	20	b20	80
Horse, cow, mule, hinny or donkey	10	b10	40
Sheep, goat, dog or the like.	5	c5	20

Embodiment B has the same principles as embodiment

A but no driving belts or pullies are used. Instead, the driven device(generator 16, contra-rotated generator 16CON., or air compressor etc.) is directly driven by toothed prime mover 1B which is kept in mesh with free-wheeled bevel gears 17.OB, 18.OB as shown in FIG.8. Upper part of prime mover 1B is made curved; either part-circular as shown in FIG.9(a) or semi-circular as in FIG.9(b). In case of using a part-circular prime mover 1B, the base 15.2 on which the operated device is mounted is positioned somewhere over neck of animal as shown in FIG.6(b) while some other components of the system are positioned on rear back of animal to achieve balance of weights. In case of using a semi-circular prime mover 1B, said base 15.2 is mounted at a relatively high position just on vertical centerlines of animal humeruses and in this case the lower part of prime mover 1B is longer than it is in the other shape; this extension is necessary for only this shape of prime mover in order to prevent collision between it and the ground when the animal kneels down; in other words, to keep providing full freedom to the animal to kneel down whenever it wants or is wanted to kneel down. NO extension is needed for the other shapes of prime movers 1A, 1B as their upper parts design allow free kneeling down.

Some animals tend to wallow, that is to roll or walter; this is a natural tendency; so, the design of the system include side wallowing preventers 15.W.P mounted to side beams as shown in FIG. 7 in a suitable position which does not interfere with the movement of prime mover or belts. When the animal tries to wallow, normal reaction of the ground is exerted on said wallowing preventers and is transmitted to the animal body side causing some pressure on a small area of the animal body to the extent that the animal dislikes this kind of pressure (although it not harmful) and hence changes its mind and dislikes to roll or walter as far as the system is on its back.

A small voltage regulator (not shown) is mounted to the saddle at any chosen position and be connected to

both the generator 16 or 16CON. and the battery by wires (not shown).

Battery (not shown) can be either a single case unit or two batteries connected together in series or in parallel (as desired) and are fitted with suitable fittings to battery base 15.4 on saddle 15A or 15B. however, there is much freedom in choosing the position for said battery base 15.4 .

For end-use, electricity can either be used as direct current(D.C.) for DC appliances or be inverted into alternating current(A.C.) by using a suitable inverter. There is a wide variety of invertors in different sizes and types available in markets (such as those used for solar and/or wind energy conversion systems); even a very small type of inverter is available for operating a single fluorescent lamp of 20 watts, for camping.

compressed air can be used for driving small turbines to provide end-use mechanical power or to drive small generators. Furthermore, compressed air can be used for operating vortex tube devices for airconditioning or space heating, since said vortex tubes are very compact, effective, simply controlled; a single vortex tube can be operated as an airconditioner and simply be converted into a space heating device by just adjusting a valve.

Concentration of power, particularly electric power, to meet a given power demand is simply carried out by connecting several batteries together either in series to provide high voltage or in parallel to provide high current capacity.

A group of batteries (battery bank) can be loaded on a single animal such as a camel to provide portable power in any desired site. Several camels carrying several battery banks can be linked tail-to-nose (a caravan) to meet any power demand at any site whatever its topography is.

With the use of polymer-lithium batteries, a single adult camel can carry a package of batteries (battery bank) of approximately 5000 ampere-hour(a.h.) capacity, 12V. D.C.;

which, by using an inverter, can be converted into 220 V., (A.C.) at an efficiency of $\pm 90\%$ to provide approximately 54 kilowatt-hour(k.w.h.)of electric energy; enough energy to meet a power demand of 6.75 kw. for a continuous work time of 8 hours.

A series of as many as a hundred camels carrying battery banks can be linked and then be driven by a single man or two providing as much energy as 5400 kilowatt-hours; enough portable power to meet a demand of 675 kw.,for a continuous worktime of 8 hours, for agriculture activity, pasturage activity,reforestation activity or any industry which require portable power.

Needless to say that all battery banks of the said caravan can be combined to form a united battery bank which needs only few large size invertors carried on board of other camels. Said combination is simply implemented by wires passing aside or being stucked down,with a Scotch tape,to the nose-band of each camel from a battery bank on board of a camel to the next battery bank on board of the next camel and so on.

EXAMPLES ON ITS APPLICATIONS:

Billions of animals are globally available and hundreds of millions of jobless people are globally causing rapid urbanization problems. The most important reasons for urbanization trends are:

1. Availability of services and amenities is deemed in urban areas.
2. Availability of electricity which is an indicator of housing standards;it not only provides the source of power for domestic lighting but also indicate access to many aspects of modern living,such as the use of appliances.

To stabilize rural population,minimize urbanization trends and even creat urban-to-rural migration are international goals. To achieve said international goals,the gap between level of life in rural areas and level of life in urban areas should be narrowed as far as possible.

The key to this narrowing of said gap is the availability of electricity everywhere in rural areas.

Rural households are spread over large areas and the provision of electricity to them through central power plants is very difficult and costly; even in case of using solar or wind power for remote sites; furthermore, great numbers of rural households are nomadic or semi-nomadic who peregrinate with their animals for pasturage.

So, the present invention provides an ideal and perfect means to provide them with their power requirements, especially electric power which they need for many purposes among which are the following applications:

1. Lighting; 2. Space heating; 3. Airconditioning; 4. cooking; 5. Water heating; 6. Powering television (T.V.) sets, radio receivers cassette recorders and other entertainment or education devices; 7. Powering communication devices such as aerial telephones etc.; 8. Providing cathode protection for pipelines and other installations in desert remote areas;

9. Powering refrigerators (either thermoelectric refrigerators--since they:utilize DC current,are very light in weight,compact,non-polluting since they need no refrigerant,and can be operated even on board of animal such as camel while it is travelling;-or conventional refrigeratos.).

Refrigeration is obviously vital for keeping milk and its products fresh until they are either consumed at the same site or sold fresh in a relatively near market to which they can be sent in thermoelectric refrigerators powered by batteries carried with them on board of animals.

On return, said refrigerators may contain some fruits or the like from the market to the rural remote site such as a pasture or a very small village;

10. Powering immersed water pumps for pumping water from lakes,rivers,shallow water wells or even deep water wells for varied uses including irrigation,livestock water needs and man-kind uses. A wide variety of compact light-weight immersed pumps is available in markets and they are ideal

for peregrinating people since said pumps can be easily carried with their light-weight hose-pipes on board of animal and be powered electrically with a battery or battery bank carried also on board of animal (thus, eliminating either the need for fixed large pumping facilities on water points or the hard work of manually lifting the needed water).

11. Powering portable devices for saline water desalination. there is a wide variety of desalination devices in small portable sizes suitable for small demands of soft water in desert and/or coastal areas; power is required to operate any of them. Reverse osmosis process, electrodialysis method and Hickman centrifugal force compression water distiller are the most suitable for portable uses; all of them require electric current. Hickman centrifugal device offers the advantages of (a): capability of being a dual-purpose device; since it can be also used for both sterilizing and concentrating milk for providing evaporated sterilized milk in order to reduce the volume and weight of milk which is intended to be carried on board of animals to markets for sale. (Thus, a single small size Hickman distiller will be enough for water desalination and milk concentration-sterilization.); (b): no membranes are required for them; hence, importation of membranes is eliminated;

12. Powering portable electric-powered milking machines to ease milking operations;

13. Powering Perrin portable sterilisation units for home dialysis;

14. Powering portable electric-powered shearing machines to clip wool, fluff or hair;

15. Powering portable electric-powered spinning machines to spin wool and the like;

16. Powering portable light-weight electric-powered weaving machines to weave wool and the like for cloth and/or tent uses;

17. Powering portable electric-powered sewing machines to sew cloths, tents and the like;

18. Powering portable light-weight hand-handled electric-powered sickles or scythes;

19. Powering portable small size electric-powered chipper/shredder machines to turn organic throwaways into useful wood chip mulch and compost materials or for manufacturing special diets for animal feed;

20. Powering portable light-weight electric-powered hand-handled tillers for small size agriculture activities.

CLAIMS

I claim:

1. A versatile animal-laden portable animal energy converting system comprising:

- (a) animal-powered prime movers each of which being fastenable to either a humerus or a thigh of an animal for utilizing its movement for providing oscillational movement of upper tip of each prime mover so as to rotationally drive an electric generator, an air compressor or a chosen device mounted on a saddle on board of said animal;
- (b) transmission means for transferring said oscillational motion into said rotational driving via driving belts and/or gears a portion of which being fitted to the upper tip of each said prime mover;
- (c) a saddle on which and to which all the remaining components of said system are mounted;
- (d) a contra-rotated electric generator operatable by a couple of said prime movers acting in parallel planes, one in each side of a single animal;
- (e) an energy storage device such as a battery carried on board of same animal to store electricity generated on board of same animal or, alternatively, a small compressed air tank carried in same manner to store compressed air compressed by an air compressor powered in same manner on board of same animal.

2. A versatile animal-laden portable animal energy converting system according to claim 1, wherein each said prime mover is alternatively:

(A): a simple-shaped rectangular bar having:

- (a) four small pivots mounted to its upper tip for providing pivots for metal rings each of which comprises an end of an unclosed driving belt;
- (b) fastening belts fitted to its lower half for fastening said prime mover to a humerus or a thigh of an animal;
- (c) small cushions mounted to the inside front of said lower half of said prime mover for convenience of animal body; or

(B): a tip-teethed prime mover the lower half of which being the same as the lower half of said simple-shaped rectangular bar, and having similar fastening belts, cushions while the upper half of it is:

- (a) curved in shape, e.g.; part-circular, semi-circular etc.;
- (b) its curved tip is teethed in a way which provides two alternate parallel "curved racks" 5B, 6B between whom a space is provided for two concentric vertically opposite free-wheeled bevel gears 17.OB, 18.OB which comprise the pinions (followers) of said "curved racks" which have a module, addendum, dedendum, pitch-cone apex and tooth thickness similar to those of said free-wheeled bevel gears.

3. A versatile animal-laden portable animal energy converting system according to claim 1, wherein said saddle is characterized in that it includes:

- (a) two side beams to each of which a pair of pivots is mounted to provide pivots for pulleys 7A, 8A;
- (b) two other pairs of pivots each of which is mounted to each upper side of said saddle to provide pivots for other pulleys;
- (c) a base on which a generator, an air compressor or a similar device can be mounted;
- (d) a base on which a battery, a compressed air tank or the like can be mounted;
- (e) wallowing preventers mounted to each said side beam.

4. The arrangement of each couple of free-wheeled pulleys with each couple of unclosed belts, whereby the driving shaft, to which said couple of free-wheeled pulleys is mounted, is rotated in one direction although the said couple of belts is frequently tensioned back and forth.

5. The arrangement of each couple of free-wheeled gears with each teethed prime mover, whereby the driving shaft, to which said couple of free-wheeled gears is mounted, is rotated in one direction although the teethed prime mover is in oscillational motion.

AMENDED CLAIMS

[received by the International Bureau
on 20 May 1991 (20.05.91);
original claim 1 amended;
new claim 6 added; other claims unchanged (3 pages)]

I claim:

1. A versatile animal-laden portable animal energy converting system including:

- (a) a contra-rotated electric generator and/or a small air compressor;
- (b) belts, pullies and gears comprising a portion of transmission means;
- (c) an energy storage device such as a battery carried on board of same animal to store electricity generated on board of same animal or, alternatively, a small compressed air tank carried in same manner to store compressed air;

said energy converting system being characterised in that in addition to its capability of being independantly operated on board of animal while same animal is freely grazing or travelling, it is also characterised in that in order to utilize oscillational movement of humerus and/or thigh of animal to produce and store electric or mechanical energy on board of same animal it includes:

- (d) animal-powered prime movers each of which being fastenable to either a humerus or a thigh of an animal for utilizing its movement for providing oscillational movement of upper tip of each prime mover so as to rotationally drive an electric generator, an air compressor or a chosen device mounted on a saddle on board of same animal;
- (e) a saddle on which and to which all the remaining components of said system are mounted as well as a wallowing preventer mounted to either side of it.

2. A versatile animal-laden portable animal energy converting system according to claim 1, wherein each said prime mover is alternatively:

- (A): a simple-shaped rectangular bar having:
 - (a) four small pivots mounted to its upper tip for providing pivots for metal rings each of which comprises an end of an unclosed driving belt;
 - (b) fastening belts fitted to its lower half for fastening said prime mover to a humerus or a thigh of an animal;

- (c) small cushions mounted to the inside front of said lower half of said prime mover for convenience of animal body; or
- (B): a tip-teethed prime mover the lower half of which being the same as the lower half of said simple-shaped rectangular bar, and having similar fastening belts, cushions while the upper half of it is:
 - (a) curved in shape, e.g. part-circular, semi-circular etc.;
 - (b) its curved tip is teethed in a way which provides two alternate parallel "curved racks" 5B, 6B between which a space is provided for to concentric vertically opposite free-wheeled bevel gears 17.OB, 18.OB which comprise the pinions (followers) of said "curved racks" which have a module, addendum, dedendum, pitch-cone apex and tooth thickness similar to those of said free-wheeled bevel gears.

3. A versatile animal-laden portable animal energy converting system according to claim 1, wherein said saddle is characterized in that it includes:

- (a) two side beams to each of which a pair of pivots is mounted to provide pivots for pulleys 7A, 8A;
- (b) two other pairs of pivots each of which is mounted to each upper side of said saddle to provide pivots for other pulleys;
- (c) a base on which a generator, an air compressor or a similar device can be mounted;
- (d) a base on which a battery, a compressed air tank or the like can be mounted;
- (e) wallowing preventers mounted to each said side beam.

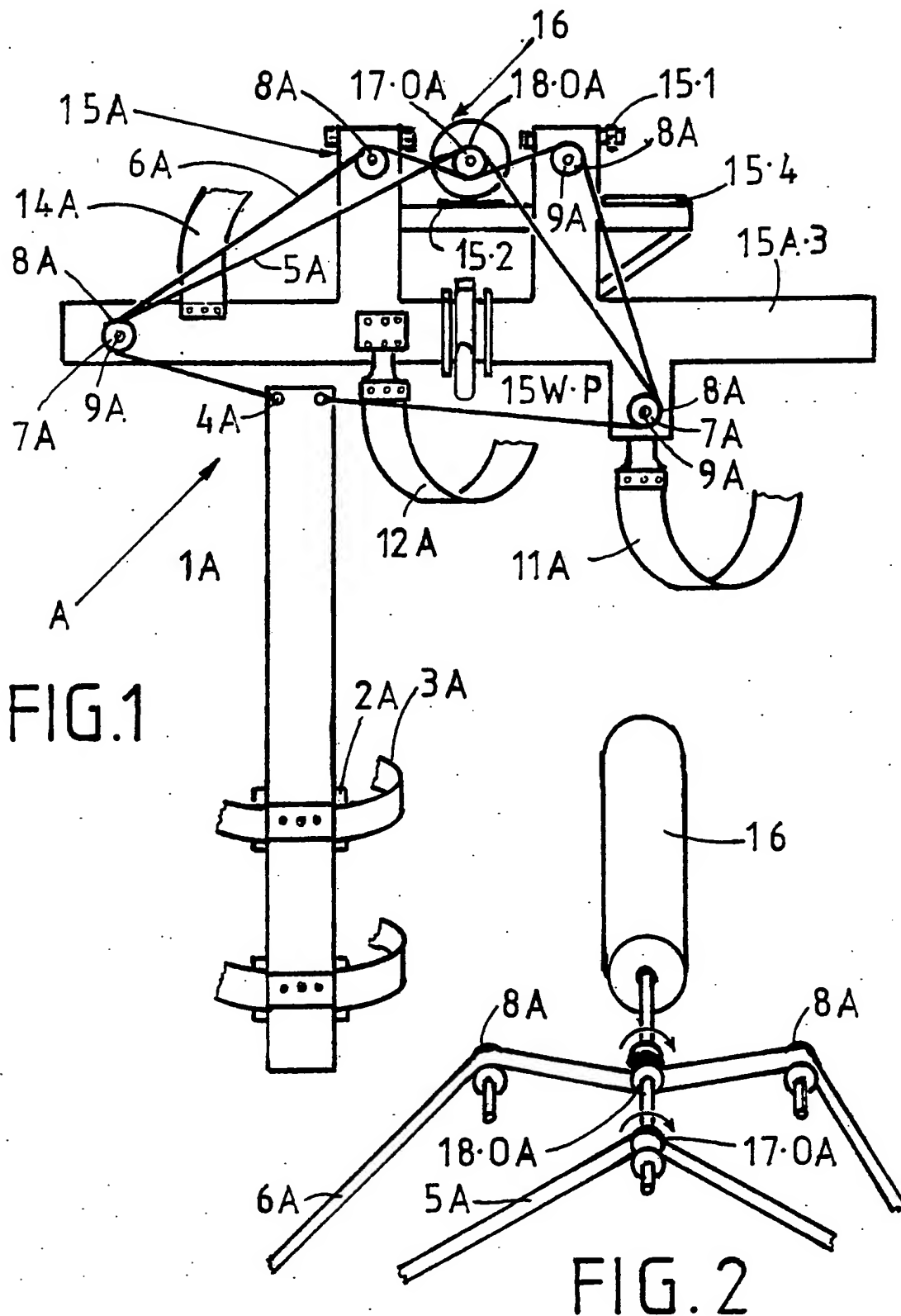
4. The arrangement of each couple of free-wheeled pulleys with each couple of unclosed belts, whereby the driving shaft, to which said couple of free-wheeled pulleys is mounted, is rotated in one direction although the said couple of belts is frequently tensioned back and forth.

5. The arrangement of each couple of free-wheeled

gears with each teathed prime mover, whereby the driving shaft, to which said couple of free-wheeled gears is mounted, is rotated in one direction although the teathed prime mover is in oscillational motion.

6. A versatile animal-laden portable animal energy converting system according to claims 1 and 3, wherein each said wallowing preventer, mounted to each side beam of said saddle, is a means of transmitting some ground normal reaction to some small area of animal body side to prevent it from wallowing as far as the system is laden on its board.

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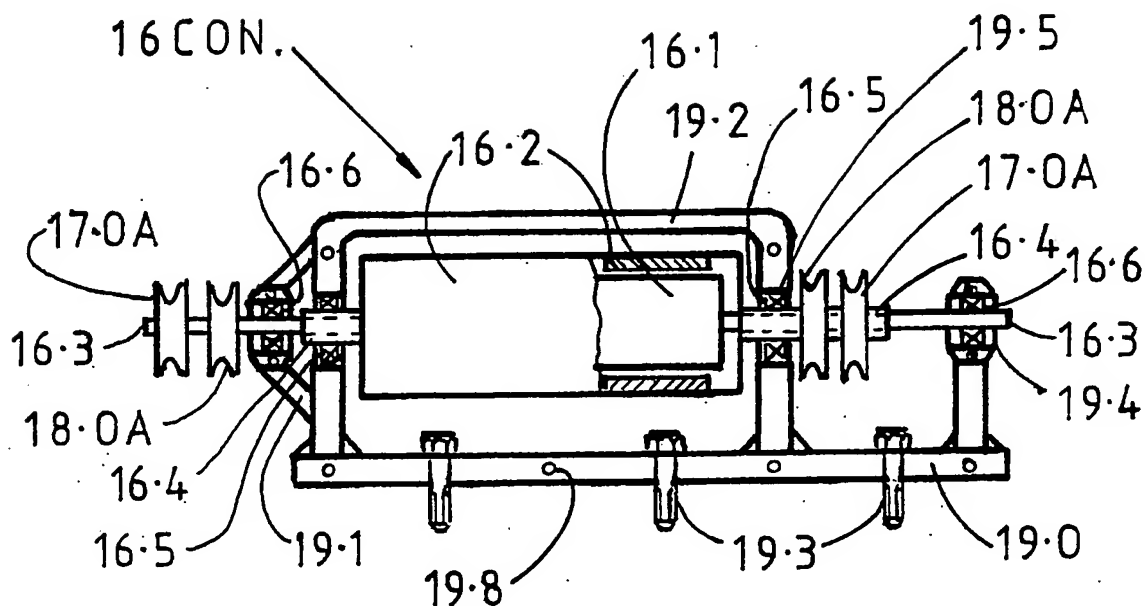


FIG. 3

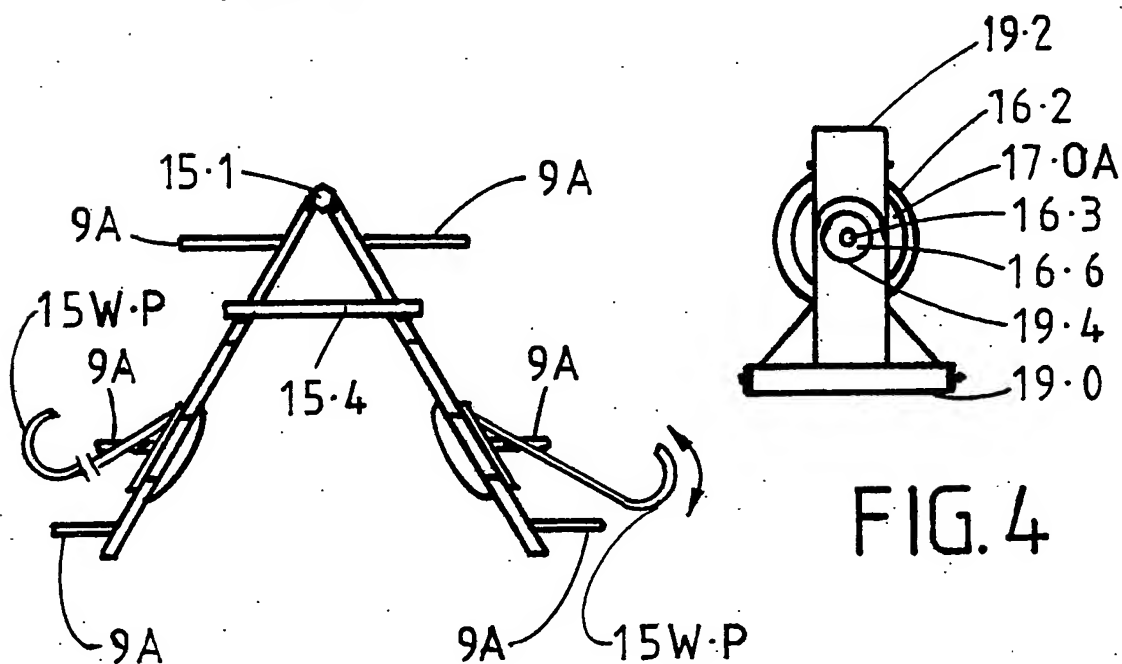


FIG. 4

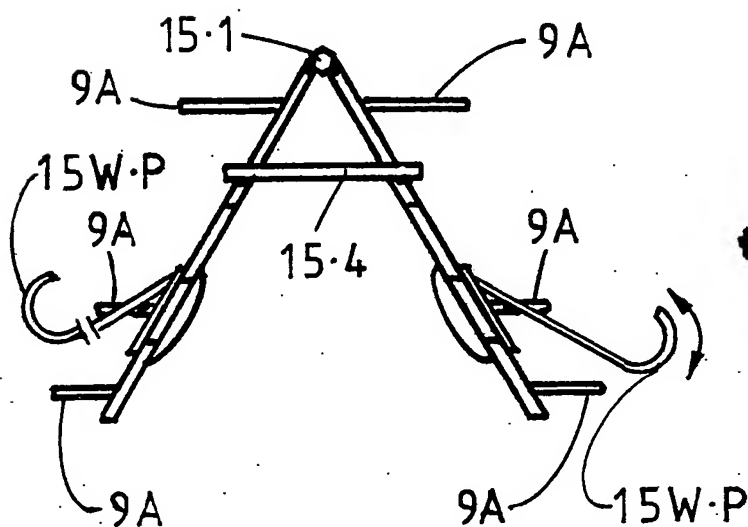


FIG. 5

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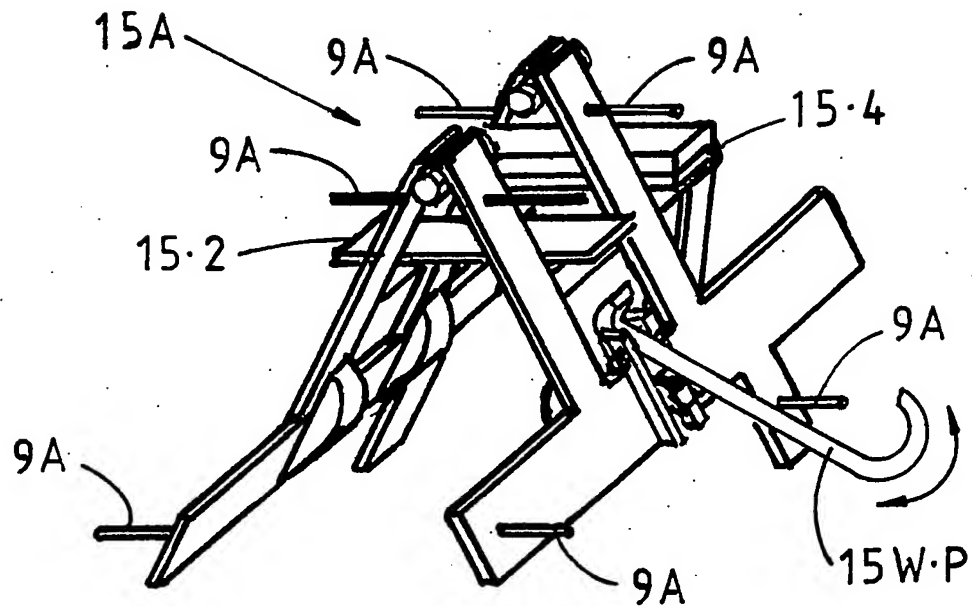


FIG. 6

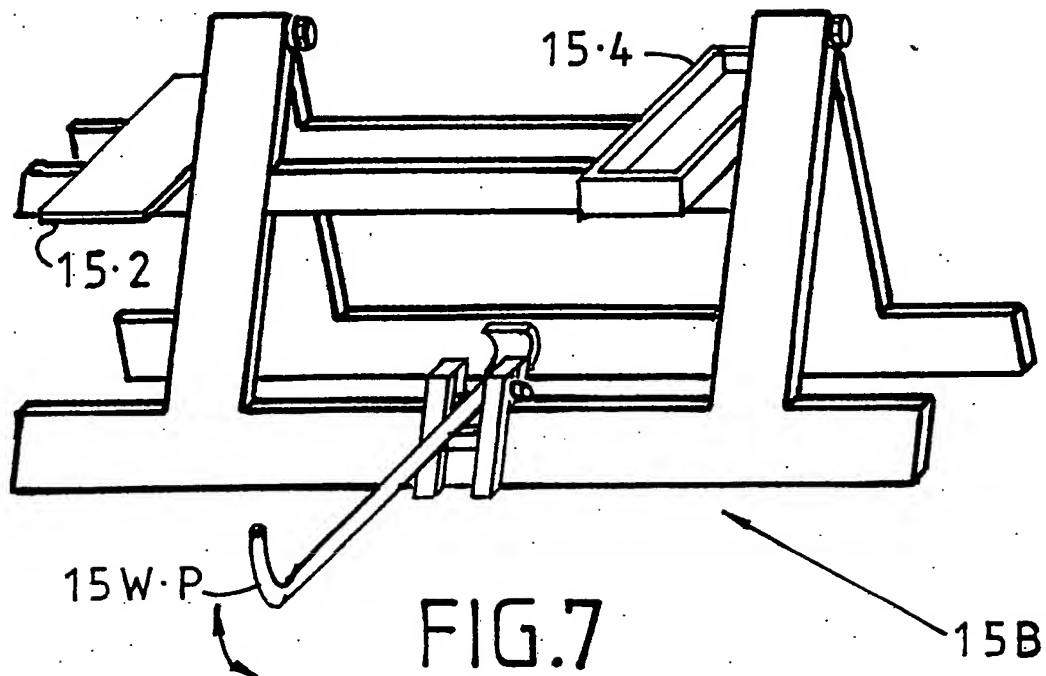


FIG. 7

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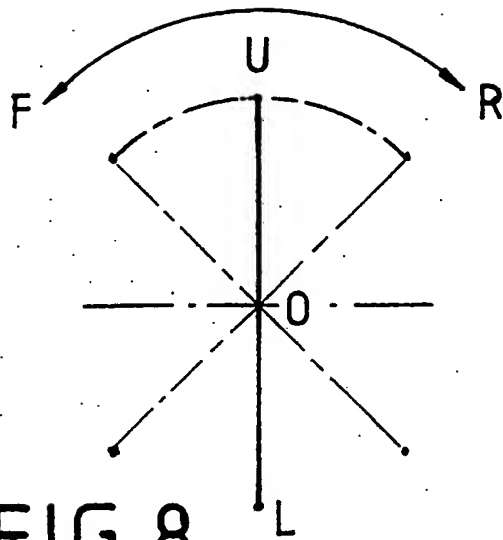


FIG. 8

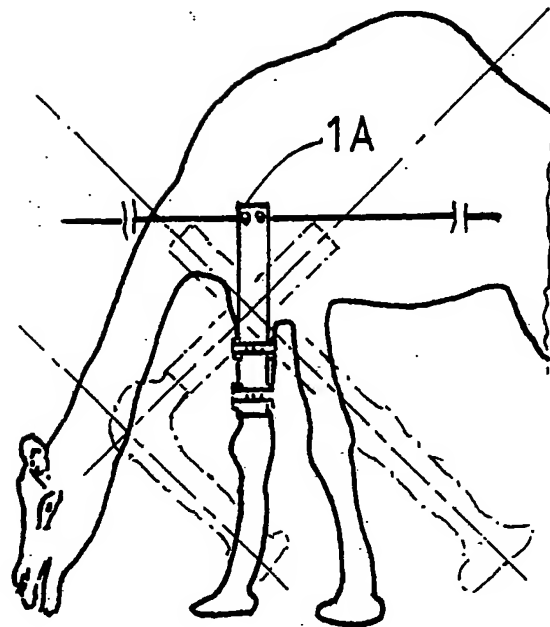


FIG. 9

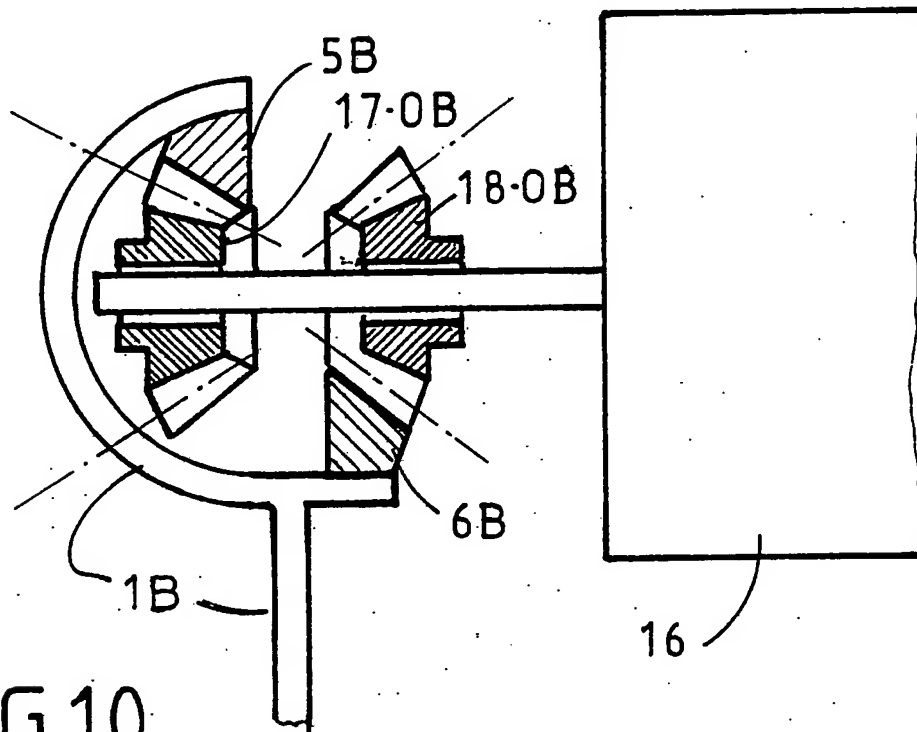
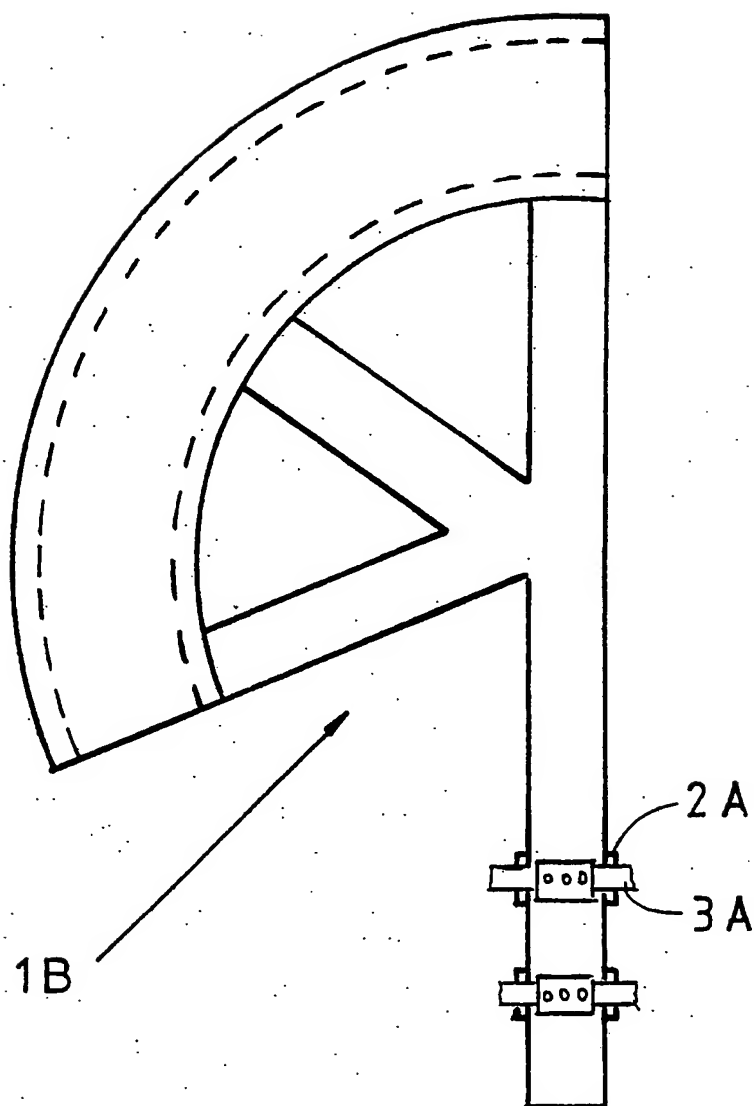


FIG. 10

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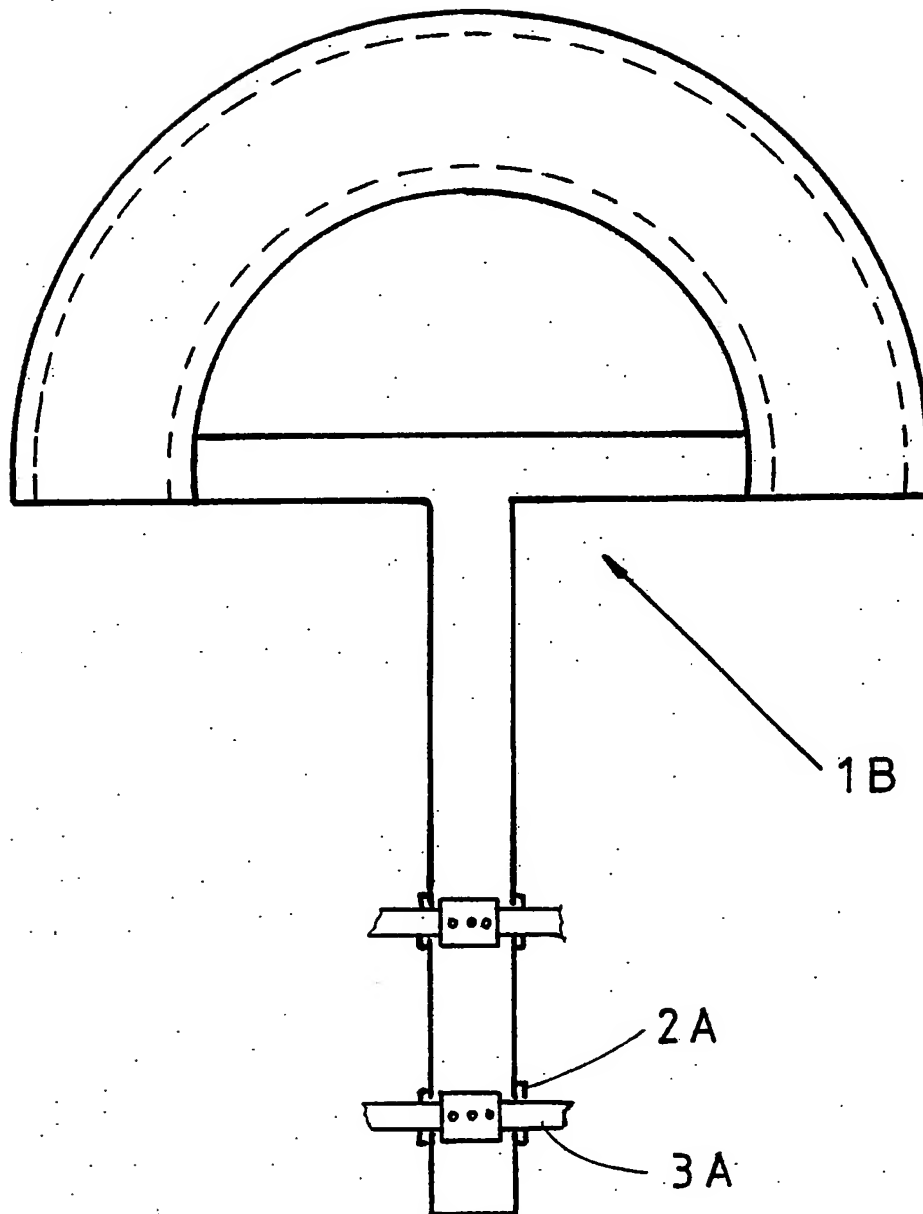
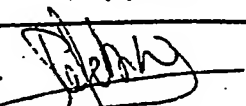


FIG.12

INTERNATIONAL SEARCH REPORT

International Application No

PCT/OA 89/00001

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 F03G5/08 ; H02K7/18		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	F03G ; H02K	
Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	FR,A,911414 (DELMAS) 08 July 1946 see page 1, lines 1 - 36; figures 1-4	1
A	---	2, 4
Y	US,A,2084612 (ENGELHEART) 22 June 1937 see column 1, lines 1 - 9 see column 1, line 37 - column 2, line 2; figure 1	1
A	---	2
A	DE,C,37510 (TIETZ) 07 February 1886 see page 1, lines 1 - 19; figures 1-6	1-3
A	PATENT ABSTRACTS OF JAPAN vol. 7, no. 222 (E-201)(1367) 04 October 1983, & JP-A-58 112438 (EIICHI) 04 July 1983, see the whole document	5
<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
07 AUGUST 1990	17. 08. 90	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	LEFEBVRE L.J.F. 	

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**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

PCT/OA 89/00001

SA 32968

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07/08/90

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-911414		None	
US-A-2084612		None	
DE-C-37510		None	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82